

AURORA'S TECHNOLOGICAL AND RESEARCH INSTITUTE
Parvathapur, uppal, Hyderabad.

DEPARTMENT OF MECHANICAL ENGINEERING

Year	Semester	Regulation	Course Code	Course Name	Course Outcomes
I	I	R16	ME105ES	Engineering Mechanics	1.Able to resolve forces and moments for a given force system 2.Able to analyze the types of friction for moving bodies and solve problems related to friction. 3.Able to determine the centroid for composite bodies and second moment of area.
I	II	R16	ME106ES/ME205ES	Engineering Graphics	<ul style="list-style-type: none"> •Able to prepare working drawings to communicate the ideas and information. •Able to read, understand and interpret engineering drawings. •Ability to perform basic sketching techniques will improve. • Students will be able to draw orthographic projections and sections.
I	II	R-16	ME208ES	Engineering Workshop	<ul style="list-style-type: none"> • The student will gain a working knowledge about the different types of welding and their applications.. • To appreciate the importance of safety at workplace and the practises involved in making it so. • The student will gain a working knowledge about the various tools and their functions. • The student will be able to identify select appropriate fitting tools for the required application. • The student will be able to what processes can be applied on a material depending on its properties. •The student will be able to apply the basic electrical engineering for house wiring purposes and basic manufacturing processes like carpentry,foundry,tinsmithy,etc..

II Year	I Sem.	R16	ME403ES	DYNAMICS OF MACHINERY	<ul style="list-style-type: none"> • the study of KOM& DOM are necessary to have an idea while designing the various machine members like shafts, bearings, gears, belts & chains and various I.C. Engine Components & Machine tool parts.
II Year	I Sem.	R16	MC300HS	GENDER SENSITIZATION LAB	<ul style="list-style-type: none"> • Students will have developed a better understanding of important issues related to gender in contemporary India. • Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film. • Students will attain a finer grasp of how gender discrimination works in our society and how to counter it. • Students will acquire insight into the gendered division of labour and its relation to politics and economics. • Men and women students and professionals will be better equipped to work and live together as equals. • Students will develop a sense of appreciation of women in all walks of life. • Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.
II year	I Sem	R16	ME302ES	KINEMATICS OF MACHINERY	<p>1.The main purpose is to give an idea about the relative motions obtained in all the above type of components used in mechanical Engineering.</p>

II Year	I Sem.	R16	ME308ES:	METALLURGY AND MATERIAL SCIENCE LAB	<ul style="list-style-type: none"> • The Primary focus of the Metallurgy and Material science program is to provide undergraduates with a fundamental knowledge based associated materials properties, and their selection and application. • Upon graduation, students would have acquired and developed the necessary background and skills for successful careers in the materials-related industries. • Furthermore, after completing the program, the student should be well prepared for management positions in industry or continued education toward a graduate degree.
II year	Isem	R16	ME305ES	Metallurgy and Material Science	<ul style="list-style-type: none"> • Understand concept of mechanical behavior of materials and calculations of same using appropriate equations . • Explain features, classification, applications of newer class materials like smart materials, piezoelectric materials, biomaterials, composite materials etc. • Analyze the Structure of materials at different levels, basic concepts of crystalline materials like unit cell, FCC, BCC, HCP, APF (Atomic Packing Factor), Co-ordination Number etc. • An ability to apply knowledge of mathematics, science and engineering

II YEAR	I SEM	R16	ME303ES	MECHANICS OF SOLIDS	<ol style="list-style-type: none"> 1. Analyze the behavior of the solid bodies subjected to various types of loading; 2. Apply knowledge of materials and structural elements to the analysis of simple structures; 3. Undertake problem identification, formulation and solution using a range of analytical methods; 4. Analyze and interpret laboratory data relating to behavior of structures and the materials they are made of, and undertake associated laboratory work individually and in teams. 5. Expectation and capacity to undertake lifelong learning
II Year	I Sem.	R16	ME304ES	THERMODYNAMICS	<ul style="list-style-type: none"> • At the end of the course, the student should be able to Understand and differentiate between different thermodynamic systems and processes • Understand and apply the laws of Thermodynamics to different types of systems undergoing various processes and to perform thermodynamic analysis. • Understand and analyze the Thermodynamic cycles and evaluate performance parameters.
II YEAR	I SEM	R16	ME307ES	MECHANICS OF SOLIDS LAB	<ol style="list-style-type: none"> 1. Analyze the behavior of the solid bodies subjected to various types of loading. 2. Apply knowledge of materials and structural elements to the analysis of simple structures. 3. Undertake problem identification, formulation and solution using a range of analytical methods 4. Analyze and interpret laboratory data relating to behavior of structures and the materials they are made of, and undertake associated laboratory work individually and in teams. 5. Expectation and capacity to undertake lifelong learning.

II YEAR	II SEM	R16	SM405MS	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	<ul style="list-style-type: none"> • The students will understand the various Forms of Business and the impact of economic variables on the Business. •The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt. •The Students can study the firm's financial position by analysing the Financial Statements of a Company.
II	II	R16	ME403ES	Dynamics of Machinery	<ul style="list-style-type: none"> • The study of KOM& DOM are necessary to have an idea while designing the various machine members like shafts, bearings, gears, belts & chains and various I.C. Engine Components & Machine tool parts. • Analyze static and dynamic force analysis of mechanisms. •Take notice of importance of the balancing and learn procedures of the basic balancing.
II Year	II Sem.	R16	MC400ES	ENVIRONMENTAL SCIENCE & TECHNOLOGY	<ul style="list-style-type: none"> •Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which inturn helps in sustainable development
II Year	II Sem.	R16	ME407ES	FLUID MECHANICS AND HYDRAULIC MACHINES LAB	<ul style="list-style-type: none"> •Able to explain the effect of fluid properties on a flow system. •Able to identify type of fluid flow patterns and describe continuity equation. • To analyze a variety of practical fluid flow and measuring devices and utilize fluid mechanics principles in design. • To select and analyze an appropriate turbine with reference to given situation in power plants. •To estimate performance parameters of a given Centrifugal and Reciprocating pump. •Able to demonstrate boundary layer concepts

II Year	II Sem.	R16	ME401ES:	FLUID MECHANICS AND HYDRAULIC MACHINES	<ul style="list-style-type: none"> • Able to explain the effect of fluid properties on a flow system. •Able to identify type of fluid flow patterns and describe continuity equation. •To analyze a variety of practical fluid flow and measuring devices and utilize fluid Mechanics principles in design. •To select and analyze an appropriate turbine with reference to given situation in power plants. •To estimate performance parameters of a given Centrifugal and Reciprocating pump. •Able to demonstrate boundary layer concepts.
II	II	R16	ME406ES	KINEMATICS AND DYNAMICS LAB	<ul style="list-style-type: none"> • Understand types of motion •Analyze forces and torques of components in linkages •Understand static and dynamic balance •Understand forward and inverse kinematics of open-loop mechanisms
II Year	II Sem.	R16	ME404ES	MACHINE DRAWING	<ul style="list-style-type: none"> • Preparation of engineering and working drawings with dimensions and bill of material during design and development. Developing assembly drawings using part drawings of machine components. •Conventional representation of materials, common machine elements and parts such as screws, nuts, bolts, keys, gears, webs, ribs. •Types of sections – selection of section planes and drawing of sections and auxiliary sectional views. Parts not usually sectioned. •Methods of dimensioning, general rules for sizes and placement of dimensions for holes, centers, curved and tapered features. •Title boxes, their size, location and details - common abbreviations and their liberal usage •Types of Drawings – working drawings for machine parts.

II Year	II Sem.	R16	ME408ES	MANUFACTURING PROCESS LAB	<ul style="list-style-type: none"> • Understanding the properties of moulding sands and pattern making. • Fabricate joints using gas welding and arc welding. Evaluate the quality of welded joints. • Basic idea of press working tools and performs moulding studies on plastics.
II YEAR	II SEM	R16	ME405ES	MANUFACTURING PROCESS	<ul style="list-style-type: none"> • Understand the idea for selecting materials for patterns. • Types and allowances of patterns used in casting and analyze the components of moulds. Design core, core print and gating system in metal casting processes • Understand arc, gas, solid state and resistance welding processes. • Develop process-maps for metal forming processes using plasticity principles. • Identify the effect of process variables to manufacture defect free products.
III YEAR	I-SEM	R15	A50318	ENGINEERING METROLOGY	*Students will able to understand various measuring standards and measurement methods.comuunicate ideas and information.
					*Read,understand various inspection methods and techniques
					* Students will gain Knowledge how a metrologist and inspector works and how to design ,use of various devices
					*Understand how a quality controle department works
III	I	R13	A50326	THERMAL ENGINEERING	<ul style="list-style-type: none"> • Conduct constant speed and variable speed tests on IC engines and interpret their performance. • Estimate energy distribution by conducting heat balance test on IC engines • Evaluate performance parameters of SI/CI engines

III YEAR	I SEM	R16	A50321	MACHINE TOOLS	<ul style="list-style-type: none"> • Understand the idea for selecting materials for patterns. •Types and allowances of patterns used in casting and analyze the components of moulds. Design core, core print and gating system in metal casting processes •Understand arc, gas, solid state and resistance welding processes. •Develop process-maps for metal forming processes using plasticity principles. •Identify the effect of process variables to manufacture defect free products.
III Year	I Sem.	R16	A50384	MT & MET LAB	<ul style="list-style-type: none"> • Understanding the properties of moulding sands and pattern making. • Fabricate joints using gas welding and arc welding. Evaluate the quality of welded joints. • Basic idea of press working tools and performs moulding studies on plastics.
III	II	R15	A60329	DMM-II	<ul style="list-style-type: none"> • Graduates will demonstrate knowledge of mathematics, science and engineering applications. •Graduates will demonstrate an ability to analyze, design, develop and execute the programs efficiently and effectively. •Graduates will demonstrate an ability to design a system, software products and components as per requirements and specifications •Graduates will demonstrate working in groups and possess project management skills to develop design software projects •Graduates will demonstrate knowledge of professional and ethical responsibilities

III	II	R15	A60330	FINITE ELEMENT METHODS	<ul style="list-style-type: none"> • Describe the general steps used in the finite element analysis to model problems in engineering. • Develop stiffness matrices for spring, truss, beam, plane stress problems and three dimensional problems. • Develop the finite element formulations for heat transfer problems. • Interpret the philosophy behind principles, design and modelling considerations in using finite element analysis • Explore the issues in convergence of solutions using finite element analysis
III	II	R-13	A60331	Heat Transfer	<ul style="list-style-type: none"> • The student will be able to understand what Heat Transfer involves, the laws which govern it and the modes through which heat transfer can take place. • To understand and analyze the different scenarios involving both Steady state and Transient heat transfer. • The student will be able to appreciate and analyze examples of transfer of heat involving a change in phase. • The student will gain a theoretical understanding on the purpose and types of heat exchangers and how one can analyze the efficiency of a heat exchanger. •
III	II	R-15	A60334	REFRIGERATION & AIR CONDITIONING	<ul style="list-style-type: none"> • The refrigeration and air conditioning systems and how they differ . • The vapor-compression refrigeration cycle • The function of each refrigeration system component: evaporator, compressor, condenser, and metering device. • The function of each refrigeration system component: evaporator, compressor, condenser, and metering device. • Air properties and simple psychrometrics.

IV	I	R13	A70328	CAD/CAM	<ul style="list-style-type: none"> • Reduced engineering personnel requirements • Designs have more standardization • Helps ensure designs are appropriate to existing manufacturing techniques • Better communication interfaces and greater understanding among engineers, designers, drafters, management, and different project groups
IV	I	R13	A70390	COMPUTER AIDED DESIGN AND MANUFACTURING LAB	<p>Designs have more standardization</p> <ul style="list-style-type: none"> . Reduced training time for routine drafting tasks and NC part programming . Customer modifications are easier to make
IV	I	R-13	A70391	Production drawing practise and instrumentation lab	<ul style="list-style-type: none"> • The student will be able to read a production drawing properly and understand the conventions used in the drawing. • To identify and reproduce the symbols used in the conventional representation of materials and components. • The student will be able to make drawings based on the required tolerances and fits. • The student will be able to draw and also read detailed part drawings. • The student will gain a working understanding of how to use CAD software to make [production drawings with the required details.
IV	I	R-13	ME A70353	POWER PLANT ENGINEERING	<ul style="list-style-type: none"> • Describe sources of energy and types of power plants. • Analyze different types of steam cycles • Define the performance characteristics and components of such power plants. • Define terms and factors associated with power plant economics. • List the principal components and types of nuclear reactors.

IV	I	R13	A70359	Unconventional Machining Process	<ul style="list-style-type: none"> • The hardness material is machining on unconventional machines. • To understand the principle and mechanism of metal removal of various unconventional machining process • In unconventional machining process there is no contact in between tool and work piece. • High precision is occur in unconventional machining. • To understand the applications of different unconventional machining processes..
IV	II	R13	A80365	Plant Layout and Material Handling	<ul style="list-style-type: none"> • Describe the importance of proper material handling and storage techniques • Describe proper material handling engineering techniques regarding hoisting and conveying equipment • Describe the formal training requirements for material handling personnel, especially equipment operators. • Describe the preventative maintenance requirements for material handling equipment.
IV	II	R-13	A80366	PRODUCTION PLANNING AND CONTROL	<ul style="list-style-type: none"> • Demonstrate and explain the use of Manufacturing Requirements Planning (MRP2), Just - In - Time (JIT) techniques in terms of operation and their importance in Lean World Class Manufacturing. • Prepare a work estimate of a specified manufacturing product and explain the importance of value analysis/ value management for both product and process design. • Explain various production control methods which can be applied to specific situations and state their relationship to the product/process involved. • Outline the process and procedures from sales to the shop floor required to obtain an authority to commence production. • Apply scheduling and material control techniques to various specified situations. Include an explanation of the need for inventory minimisation procedures and how these might conflict with delivery response objectives.

